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processing the data for each bin; and
outputting the data at a regular interval.

Remarks

Claims 1-23 are pending in this application. Claims 1-23 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,483,499 to Brumley et al. ("Brumley").

A. Claims 1 through 7.

The Examiner has rejected claims 1-7 under 35 U.S.C. § 102(b) as being anticipated by Brumley. A rejection under section 102(b) requires that each element of each rejected claim be disclosed in a single prior art reference. As such, each element of claims 1-7 must be disclosed in Brumley. Claim 1 has been amended to clarify that the acoustic Doppler current profiler (ADCP) of claim 1 is moving vertically through the water column that it is measuring during the time that the ADCP is attached to a remotely operated vehicle (ROV). The data is then processed by a computer and displayed in real time.

Brumley simply does not disclose these elements of claim 1. The subject matter of Brumley is completely unlike the subject matter of claim 1. Brumley is directed to an "acoustic Doppler current profiler" or ADCP. (Brumley, col. 1, lines 15-16). An ADCP is merely one component of the claimed invention, which also includes an ROV, a computer, and a graphical display. The claimed invention is not at all related to the design of an ADCP.

Specifically, Brumley does not disclose an ROV or vertical movement of the ADCP through a water column during the use of the ADCP. There is simply no mention in Brumley of any vehicle designed to travel vertically through the water. Figure 5 of Brumley is

“a mechanical assembly . . . that houses and protects the electronics (FIG. 7) necessary to implement the broadband ADCP” of Brumley. (Brumley, col. 10, lines 28-31). Nothing in Brumley suggests that the assembly is anything more than the physical embodiment of the ADCP. There is also no indication in Brumley that the assembly is capable of independent movement, which leads to the conclusion that the assembly is not a separate vehicle. It is clear that Brumley’s ADCP is not intended to be used while traveling in a vertical direction through the water column because Brumley does not teach attaching an ADCP to something like a ROV, but rather only teaches that the ADCP “may be attached to the hull of a vessel, remain on stationary buoys, or be moored to the ocean floor as is a current profiler 100 shown in Fig. 2.” (Brumley, col. 2, lines 3-6). Figure 2 discloses an ADCP moored to the ocean floor. (Brumley, col. 6, lines 63-65). Also, Brumley does not contemplate vertical movement of the ADCP during use because its corrections for velocity in its equations are based only on horizontal movement of the ADCP, and not on any change in depth. (Brumley, col. 1, lines 39-59).

Specifically, Brumley also does not disclose a computer system for receiving and processing data, including depth and heading data from the ADCP, and displaying the processed data in real time. Brumley does not disclose receiving depth and heading data from the ADCP. While Brumley does disclose that other data may be transferred from its ADCP for “post-processing of current profiles in real-time,” (Brumley, col. 11, lines 1-2), Brumley does not teach displaying even that data in real time. Brumley discloses diagrams of current profiles in Fig. 1a and Fig. 1b, but does not suggest that such diagrams are representations of real time displays. (Brumley, col. 6, lines 57-62).

The rejection of claims 2-7 under 35 U.S.C. § 102(b) over Brumley will not be discussed individually. Claims 2-7 depend from claim 1. Because claim 1 is allowable over

Brumley, dependent claims 2-7 are likewise allowable over Brumley. Applicants request that the rejection of claims 1-7 under 35 U.S.C. § 102(b) over Brumley be withdrawn.

B. Claims 8 through 15

Claims 8-15 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Brumley. A rejection under section 102(b) requires that each element of each rejected claim be disclosed in a single prior art reference. As such, each element of claims 8-15 must be disclosed in Brumley. Claim 8 has been amended to clarify that the ADCP of claim 18 is moving vertically through the water column that is being measured. Both the depth and heading data from the ROV, as well as from the ADCP, are then processed along with the measurements from the ADCP.

As stated above with respect to claim 1, Brumley simply does not disclose these features. Specifically, Brumley does not disclose the use of an ROV, the receiving of data concerning the heading and depth of the ADCP from the ROV or the ADCP, nor the real-time processing of such data. There is simply no mention in Brumley of an ADCP moving vertically through a water column.

The rejection of claims 9-15 under 35 U.S.C. § 102(b) over Brumley will not be discussed individually. Claims 9-15 depend from claim 8. Because claim 8 is allowable over Brumley, dependent claims 9-15 are likewise allowable over Brumley as these claims depend from an allowable base claim. Applicants request that the rejection of claims 9-15 under 35 U.S.C. § 102(b) over Brumley be withdrawn.

C. Claims 16 through 23

Claims 16-23 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Brumley. A rejection under section 102(b) requires that each element of each rejected claim be

disclosed in a single prior art reference. As such, each element of claims 16-23 must be disclosed in Brumley. It is specified in claim 16 that the ADCP of claim 16 is moving vertically through the water column that is being measured and is transmitting data, including depth and heading data, that is being processed in real-time.

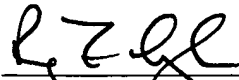
As stated above with respect to claims 1 and 8, Brumley simply does not disclose these features. Specifically, Brumley does not disclose receiving data concerning the depth or heading of the ADCP from the ADCP, nor does it disclose the real-time processing of such data. As stated above, there is simply no mention in Brumley of an ADCP moving vertically through a water column.

The rejection of claims 17-23 under 35 U.S.C. § 102(b) over Brumley will not be discussed individually. Claims 17-23 depend from claim 16. Because claim 16 is allowable over Brumley, dependent claims 17-23 are likewise allowable over Brumley. Applicants request that the rejection of claims 17-23 under 35 U.S.C. § 102(b) over Brumley be withdrawn.

Conclusion

In view of the foregoing amendments and remarks, applicants respectfully request that the rejection of claims 1-23 be withdrawn and that these claims be passed to issuance.

Respectfully submitted,



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Baker Botts Docket Number: 019929.0144

Date: March 31, 2003

EXHIBIT A

The claims have been amended as follows:

1. (Amended) A water current measuring system comprising:
an ROV;
an ADCP coupled to the ROV; and
a computer system for receiving and processing ADCP data and ROV data and displaying processed data in real time as the ADCP and ROV are moving in the vertical direction [move] through a water column;
wherein the processed data includes depth and heading data from the ADCP data if such depth and heading data is of a sufficient quality.

8. (Amended) A method for processing water current measurements in real time, comprising the steps of:

receiving depth and heading data from ROV;

receiving from an ADCP, as the ADCP is moving in the vertical direction through a water column, water current velocity data associated with depth cells within [a] the water column;

receiving depth and heading data from the ADCP if the depth and heading data of the ADCP is substantially free of interference;

processing the current velocity data from each depth cell into data associated absolute depth;

assigning absolute depth data to virtual bins;

processing the data for each bin; and

outputting the data at a regular interval.